swelling in the region of the inferior turbinate, whenever such swellings extend to and close the nasolacrimal outlet; dilatation of the latter also, as in ozena, may likewise cause disease of the lacrimal drainage apparatus through entrance of diseased products from the nose mechanically or by extension through continuity. The treatment in these cases is cure of the nasal affection. Dislocation of the globe by mucoceles and tumors are too well known to require special mention; the same is true of affections of the optic nerve. The possibility of reflex neuroses of the eye of nasal origin should also be borne in mind; proof of the rhinologic origin of cataract, glaucoma, etc., has not yet been furnished.

PATHOLOGY AND BACTERIOLOGY

UNDER THE CHARGE OF
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Streptolysin.—Although the use of the blood-agar plate for the differentiation of alpha and beta hemolytic streptococci has become quite general, there has been a lack of uniformity of method and but little attempt at standardization. Impressed by the fact that the hemolytic zones surrounding colonies of the beta hemolytic streptococcus were wider and clearer on 10 per cent. sheep's blood-agar plates than on those prepared from similar concentrations of rabbit and human blood, De Kruif and Ireland (*Jour. Infect. Dis.*, 1920, xxvi, 285) have studied hemolysin production by these organisms on blood accessible to general use, in order to ascertain whether variations in suitability exist among these bloods and to determine their optimum concentration for maximum production. Beef-infusion broth was employed in all cases, being adjusted to a hydrogen-ion concentration of pH 7.8. The investigations included studies on human, rabbit, sheep and horse blood. Instead of following the previously described methods of titration of filtrates or whole cultures the authors titrated the supernatants of early broth cultures seeded with from eight to twenty-four-hour cultures of hemolytic streptococci against constant quantities of the washed erythrocytes. Extensive experimentation was carried out, the results being recorded by tables and graphs. It was found that lysin production reached its maximum for the strains studied at a very early period in the life of the serum broth culture. When the serum broth was inoculated with young (eight to twelve hours) cultures this peak was reached in from seven to eight hours. In older cultures the crest may be deferred to twelve hours. Heated serums were usually superior to unheated ones. Sheep and horse serum were superior in all concentrations to human and far superior to rabbit serum broth. From the results of their experiments the authors devised a new blood-agar plate with the idea of using the optimum serum concentration for maximal lysin production of a blood both efficient and available. Sheeps' blood was recommended, the serum-cell mixture being made by adding 1 part of cells to 4 parts of heated serum. This mixture was then combined with liquid agar in the proportion of 1 to 3, so that the final concentration was serum, 20 per cent.; cells, 5 per cent.; and agar, 75 per cent. This medium was found to be not only suitable for demonstrating the hemolytic zones of beta streptococcus but efficient in exhibiting the multiple concentric zones of green production and hemolysis for alpha streptococcus and pneumococcus.

Experimental Streptococcus Empyema; Attempts at Prevention and Therapy by Means of Vaccine and Serum.—The importance of streptococcus empyema has not only not decreased but has become intensified during the last year or so by its occurrence as a fatal sequel to influenza as well as in its previous relation to spontaneous bronchopneumonia and bronchopneumonia after measles. GAY and STONE (*Jour. Infect. Dis.*, 1920, xxvi, 265) undertook the present study not simply in an effort to proceed toward a possible practical method of treating streptococcic empyema, but in a desire to contribute some information to the larger question of streptococcic immunity as a whole. The experiments were conducted on rabbits by means of a single pure strain isolated from the lung of a fatal case of bronchopneumonia complicated by empyema and pericarditis, and though culturally of the S. pyogenes group, was immunologically unclassified. Beef infusion broth, pH 7.2 to 7.4, and containing either 1 per cent. glucose or 5 per cent. sterile fresh rabbit serum, was the medium employed. In counting the bacteria it was found that the Wright method, when checked by the gravimetric tests, gave accurate and consistent results. The particular strain was not markedly pathogenic for rabbits by intravenous inoculation. Attempts to increase the general invasive properties of the cultures for rabbits were unsuccessful, as were all attempts to produce bronchopneumonia by bronchial insufflation. Empyema could be procured, however, by injecting small quantities of broth cultures into the pleural cavity, particularly when subcultures from the pleural fluid of an animal with fatal empyema which had been passed through the pleuræ of several animals was employed. Death occurred in from one to seventeen days, the average being five days. Of 103 rabbits injected by a constant dose of a uniform passage culture, 102 showed involvement of one or both chests, with or without pericarditis. There was no evidence of an elective localizing affinity with the strain used. If sufficient amounts of killed and subsequently living cultures of streptococci were given over a considerable period of time, protection against empyema occurred. The total number of bacteria injected, rather than the number of injections, seemed to be the decisive factor. The immune serums produced gave positive agglutination reactions at 55° C. in dilutions of from 1 to 400 to 1 to 12,800. The technical difficulties were surmounted by using a constant homogeneous suspension, made by the addition of phenol in a final concentration of 0.2 to 0.5 per cent. to a twenty-four-hour serum broth culture. The serum of the animals in which active immunity had been proved by intrapleural inoculation was found to vary in tropin content from five to eighty times that of normal rabbit serum. Satisfactory precipitin reactions were obtained